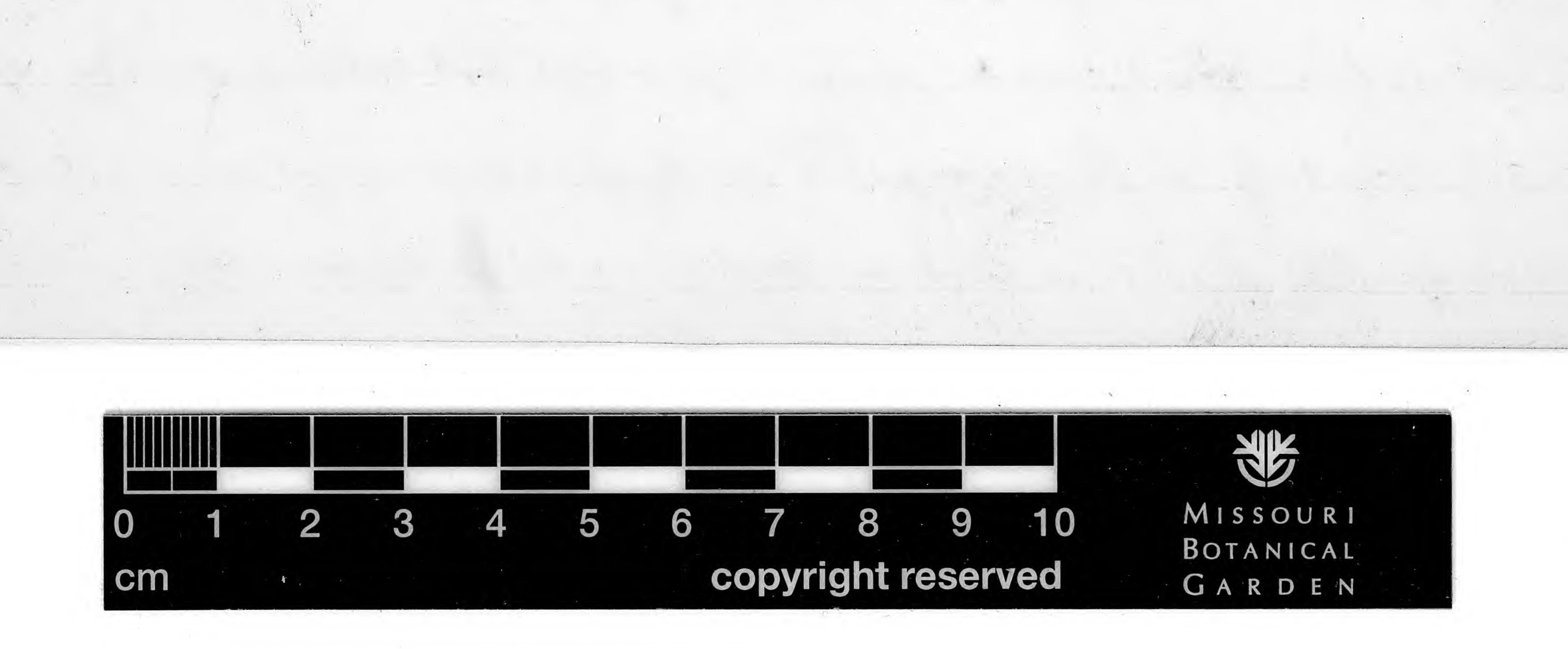


Since many of the items lack a specific page number, the page number displayed online refers to the sequentially created number each item was given upon cataloging the materials.

formerly confounded with others, and first clearly established by Durine C.c. C. g. Pringle. _ This is the original Linnean species Valways readily rerognized by its rigid rather thick not gradually tapering Tack green leaves, which do not collapse when taken out of the water, and by the size and soulpture of the spores. The variety paymala is based on western mountain sperimens and is characterized by the smaller proportions of all parts and esperially of the for the speries, unusually unall microspores. Duvien in Bull l. c. 71 p. 101 distinguished a form with exceptionally large nacrospores (0.70 to 0.80 mm diam.) as I. macrospora from a single specimen from the Herb. Acad. N.S. Philad, with the label. " Calskill Mountains" in the hand writing of Schweinity, In the same Herburium is a specime complete counterpart of their specimen, with the late , Both lehem" and a third one in the imperial Macrown at It following All the more probably come from Schweinig) and from the Calskill Mountains and where the spirits has a been from ince Such others show sometimes spores of similar Simensions, e.g. specimens from Lake Superior, and such have also been found in Europe, Though There the spores rarely reach a size of over 0.65 to 0.70. "Simula 2. I pygmaca Lagelm. One of the smallest speries with few (5 to 10) short (/2 to 1 inch long) stout, nigid, bright green leaves, abruptly tapering to a fine point, with very short, often almost square epidering cells; orbicular sporangium with a narrow volumi, not spotted, macrospores 0.36 to 0.50 mm Thick, marked with minute rather regular,





distinct or morely confluent, wants. microspores 0.024 to 0.029 mm long, almost smooth Am Naturalist J. 214 Found only once I in a rold alpine stream on the eastern slope of the California
Mono pass & 7000 ft all . H. Adolander _ This curious Siminutive species is a close ally to the last fraith it has the structure of the leaves and the most of living but is widely separated from it by the soulptime of the spores, The shortness of the epidermis cells is quite peculiar to it and so are the close transverse partitions, the walls of the leaf and the Sissepriments are Thinner Than in the last, consisting of only a few layers of cells. The minute tubentes of the meonspores are most distinct on the lower surface, but become sometimes confluent on the upperfile 3. I. Inchermani, A. Braun in litt. A small plant with very slender Tapering olive green leaves (10 to 30 ju number, mostly 2 to 3 inches long) The outer recurred, walls and partitions rather thick for the Nimeter of The leaf, sporangium mostly oblong, white or rarely brown-spotted, the upper third covered by the velum, marrospores 0.44 to 0.56 mm. Sam. the apper segments marked with prominent, some shal parallel and branching ridges, the lower half reticulated; microspores smooth or nearly so, 0.026 to 0.032 um long - layelm. in Gray Man 1. r. 676. In several ponds and streams near Boston, maturing from August total first discovered by E. Tuckerman vi the Myster Oliver very near where it issues from the pond; in the same locality and Myster, Spy and Horn



ponds, W. Booth, "in shellow water, sometimes only a few inches below the surface, but always immersed generally in places which are subject to a Tibe of sometimes two feel in higher that in frosh water, generally gregarious and carpeding the bottom with an alive green thirt, The leaves are issually not longer than 2 or 3 inches, and at least the outer ones, recurred, occassionelly, in slender sperimens, probelly from dup water, I have seen their strighter a dover of jacker long. The sculpture of the spores is very chamilerister, wary, somewhat branching ridges run from the 3 uppen sommissures in right angles, on the lower surface they interlace, rovering it with an irregular net work. - Some sperimens collected by the Boot at the end of october Them to indicate a second growth as within the circle of unicrosporebearing leaves and after the outer ones with their microsperangia had fallen bearing an inner growth of macrosporargia was noticed. " One of his sperimens is of particular morphological interest as it shows four heads or leaf buds from the same healthy and vigorous trunk, & close together on top and a fourth on the side, separated by a deep invision in the trunk from the others. This Division of the axis did not result from any proliferation of the leaves but most probably from a lesion of the renter of vegetation, and is of very same occurrence in this genus, where the simplicity of the caxis is so particularly marked (see above p. 358)



GARDEN

cm

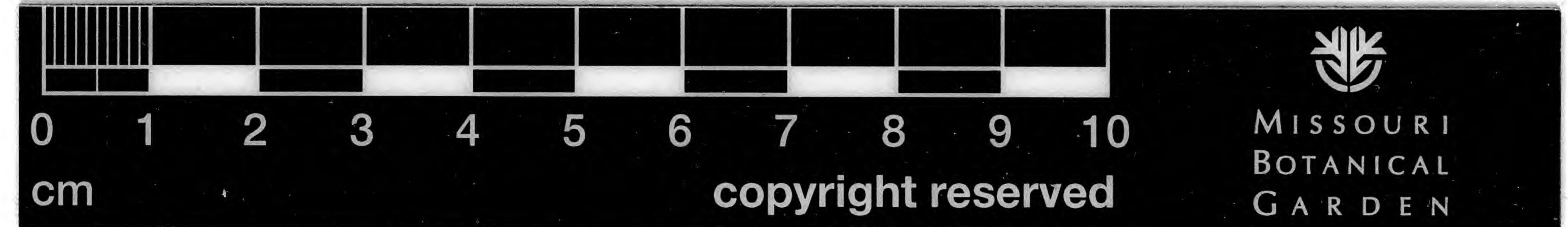
4. L. echinospora, Durien. One of the smaller species with 10 to 30 or 40 soft bright green or sometimes reddish leaves, graduelly and regularly absolutely without stomata tapering from a thick base to a very slender clongate I tip point 1 2 to 4 or sometimes 5 inches long; sporangia circular to broadly oval, unspotted, with a narrow relam; marrospores 0.40 to 0.50 mm thick, leasely covered with Verent, trumente or slightly forked spinules; microspores 0.030 to 0.034 mm long, almost smooth. _ Bull. Bot Sor Fr. 8. 164 Orly in Europe from northern Haly to Germany France and England and extending to Lapland and Ireland, but apparently not in America . I have joined with this Considered forms from forms from forms from the distinct by eminent authority, ferause the only essential difference and often sixtinel to discover shirt I can find consists find the presence of Islamata, few on many, and fra slight difference in the (microspoper) springles of The spores, But it remain a matter of doubt or I should better day, of infividual judge med f, whether they ought to be considered distract They united or be kept separate. Lather country the we know a series of forms which have been Nitringwished so various in number and by excinent authority, especially on acrount of the preserved often so difficult to discover of stornata and of a slight difference in the form and size of the microscopic spinules thich cover the innerva porces. I have thought best to unite of specifically though it seems strange that in the European plant stomate should habsolitely their with the European Type of and it issuest remain subject






** Stomate spestly for and of months tip of the light to individual judgment if not doubt, which view ought the preferred. Record to the Caropean true I echicospora stands the var. Braunis and the other extreme is War. muricula, wide ranging forms of a single type. The same difficulties, the same Soulls and the same solution we find in studying some foreign forms and especially those allies to I. velata of the South of large smattype xx Stomatal few. sather I. echinospon Bar. Braunic Engelm. Vomall, with 15 to 13 green or redlish. green erect or spreading rather short (3 to 6 inches long) tapening sopleaves, generally with few stomate towards the lip only, sporangia orbirular to Broadly elliplind, spotted, generally /2 or even 3/4 covered by a broad velum, macrospores 0.40 to 0.50 mm Thich, rarely a little larger, covered with broad retuse sometimes somethet confluent and then dentate or invised spinules; microspon 0.026 to 0.030 mm long, smooth. - Gray. Man. l.c. Vourieu l.c. The most common species of our flow, from New Jersey and Tennsylvania north card and northwest ward, sometimes on gravelly soil at other places reported from soft mind, in ponds or slow running Freams, rarely near the banks of larger lakes or under the influence of Tide water, normally submerged from a few inches to several feel, in dry seasons sometimes getting out of water. His found associated with Eriocaulon septangulare, Lobelia Gordmanna, Sparganiam, Sorpur, Elcocharis, etc. In New Jersey:






in tide water of Tom's River, a stender long leaved form, C.F. Parker, C. E Smith at others, in a lake in Morris County, J. C. Porter Konnsylvania: Mordrose, Susquehanna Co, H. V. Garber, Great Lake, Ibrono & Mountain, Porter & Canby Presque Able, Eric A.P. Garber. Naw York: Calskill Mountains in the Lake near the hotel g.W. Clinton; Round Lake above Bollon, west A Leke George, en white sand, and in Lake Placeide, d'desquereux; Lugern Lake, J. W. Cliston fand in Ningam Aver below Bufalo ;
between stones
at he head of Goal Island, Naigara, V G. Engelmann; Oneida Lake, J. A. Paine in Oswego Niver F. Tursh, probably, see pay 35.3; Massachusetts: Mystir Good gregarious in soft mied , war the lower end of the point in I foot of water also in other parts of the same pond, in Spel, spy and Hom Ponds on sandy bottom, all war Boston, W. Boot , Hammond's Pond, W.G. Farlow, Concord Brook, gregarious on firm bottom, A. Mann. Beaver Pond near Beverly J. L. Russell, Ux bridge in Grafton Vond and several other ponds, J. W. Robbins. Vermont, Mount Mansfield, in the Lake of the Clouds, C. g. Pringle, H. Mann, on gravelly bolloms, I to 2 feet deep, Lake Dun more, AW Chap man. New Hampshire Lake Winnepiscogee , in mud with Gratisla aurea, Erio caulon etc Je Engelmann (These specimens were the type of Durieu's I. Oraunii) H. Mann, W Boott; Echolake in the Franconia Unalong (where Mr. Juckerna and myself had found T. Carustinis) W. Booth. Maine: Moose lake





on Kennebunk Aver, C. & Smith, Nova Scolia, Shelburne I P. James. Greenland, in the south " Tessermint " I. Vahl (by puhaps this is the two I echinospore, I could not analyze the small and poor specimen in my possession). West and the species has been found in western Canada (Onlario) near Hastings and is a lake northeast of Belleville, on a muddy bottom in I. Maroun. Michigan: Belle Isle in Detroit aver Higillman, What, Sike at the head of Bear Bour in the Mintah mountains at 9500 feel all. S. Walson : this is the most vestern and highest, quite isolated levelity, known to me. This form is most closely connected with the European type; The leaves are perhaps not quite so firely tapering; No mata can white in the type, at least new the tip of the leaf; the sporangia, white in the type, are spothed with brown sclerenchym cells; the macrospores I can not distinguish either in size or soulplure, the mirrorpores I fish a little smaller. I may state here That the name of J. Bruining I preoccupied as it deposits, the well marked spores of which have been discovered in the German Brown Coal Strate, Por Braun therefore proposed for our plant the it should eventually be considered distinct, the name Var. robusta & Similar to the last, but much stouter, with 25 to 70 leaves, 5 to 8 inches long, with abundant stomate all over Their





surface, volum covering about one helf of the large, spotted sporangium, macrospores 0.36 to 0.55 mm Thick, with the sculpture of the last, microspores the same as in last.

In Like Champlain on the north end of Isle La Motte on a firm sand, soil with silf, in I to 2 feet of water, C. G. Pringle, Larger and stouter then any form of the last but principally distinguished from it by the abundance of stomata.

Var. Boothis', Engelow. C.c. Leaves erect; soft, bright green, fewer (12 to20) short (4 to 5 inche long), stomata mostly few, near the tip; sporangia nearly orbifular, pale-spotted, $\frac{2}{3}$ or more covered by the broad velum; marre-spores 0.39 to 0.50 mm thick with longer and stenderer, generally simple Istite spinules. microspores 0.026 to 0.030 mm. long. _ I. Bootti, Albrum in Cit. Near Boston, W'm Boot, in the Round Fond, Wobern 2 to 3 feet under water and in the brook of To fit Swamp, was dexington, sometimes out of water. - Very striking on account of the delicate green colour of its Soft leaves and the long and slender spinules of the spores.

Var muricata Engelm. l. c. Leaves Vlong & flacoid, bright green (15th 20) with very few stomate, sporangium broadly oral, pile-spotted, about hely covered by the velum; macrospores a little larger, 6.40 to or 88 min Thirt, with shorter and more confluent, therefore almost crest-like spinules, microspores slightly rough on the edges, 0.028 to 0.032 min long. - L. munionta, Survieu l.c.



